

traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims. Independent claims 1-8 are directed to a method for manufacturing a semiconductor apparatus, the method comprises forming a mask comprising a resist over a semiconductor to overlap with a portion of the semiconductor; adding an impurity element to the semiconductor in accordance with the mask, where an area of the mask is at most 35% of an area of the substrate. For the reasons provided below, Yamazaki and Jaeger, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

The Official Action concedes that "Yamazaki fails to disclose the mask precise parameters of the mask area" (page 2, Paper No. 20060320). Also, the Official Action

asserts that "[it] would have been obvious to ... make the mask 15% of the substrate area ... since [it] has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art" (page 2, Paper No. 20060320). Further, the Official Action asserts that Jaeger teaches that "the use of a smaller mask would enable one to dope more of the semiconductor also modulating the mask area is very well known in the art" (Id.). The Applicant respectfully disagrees and traverses the above-referenced assertions in the Official Action.

As explained in the present specification, a resist used as a mask is degassed by ion beam irradiation. Due to this, pressure in a treatment chamber is suddenly increased. The present inventors found that pressure inside a treatment chamber can be at most 0.15 Pa as shown in Figure 1 of the subject application by setting the resist area proportions to at most 35%. Also, the pressure inside a treatment chamber can be reduced to 0.15 Pa or lower by setting the resist area proportions to at most 15%, as shown in Figure 1 of the subject application. Ions can be implanted without generating abnormal electrical discharge (arcing) inside the treatment chamber under these conditions.

Yamazaki and Jaeger do not recognize that the above-referenced advantages would result from adjustment of a percentage of an area of a mask with respect to an area of a substrate, much less the particular percentages recited in the present claims.

Also, as set forth in MPEP § 2144.05, "[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

In the present case, as noted above, "Yamazaki fails to disclose the mask precise parameters of the mask area." Jaeger merely appears to teach the general use of masks. However, the Official Action has failed to sufficiently show that one of skill in

the art at the time of the present invention would have recognized that a percentage of an area of a mask with respect to an area of a substrate is a variable which achieves a recognized result, much less that a percentage of an area of a mask with respect to an area of a substrate should be at most 35%, or any of the other claimed percentages.

Furthermore, the Federal Circuit reversed a rejection based on inherency, which was based on what would result due to optimization of conditions, not what was necessarily present in the prior art. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

Therefore, Yamazaki and Jaeger do not teach or suggest a method for manufacturing a semiconductor apparatus, the method comprises forming a mask comprising a resist over a semiconductor to overlap with a portion of the semiconductor; adding an impurity element to the semiconductor in accordance with the mask, where an area of the mask is at most 35% of an area of the substrate.

Since Yamazaki and Jaeger do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

The Official Action rejects dependent claims 20-27 as obvious based on the combination of Yamazaki and U.S. Patent Application Publication No. 2005/0011455 to Yamamoto.

Yamamoto does not cure the deficiencies in Yamazaki and Jaeger. The Official Action relies on Yamamoto to allegedly teach the features of the dependent claims. Specifically, the Official Action relies on Yamamoto to allegedly teach a substrate with an area of one square meter (page 3, Paper No. 20060320). However, Yamazaki, Jaeger and Yamamoto, either alone or in combination, do not teach or suggest a method for manufacturing a semiconductor apparatus, the method comprises forming a mask comprising a resist over a semiconductor to overlap with a portion of the semiconductor; adding an impurity element to the semiconductor in accordance with the

mask, where an area of the mask is at most 35% of an area of the substrate. Since Yamazaki and Jaeger and Yamamoto do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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